

### Abstract

An analytical circuit for an inductive electromagnetic sensor with external excitation (1) generates an output signal which is transformed to give an output signal (out), by means of transformation to a reference voltage ( $V_{ref}$ ) in an inverting low-pass filter (12), which has no hysteresis delay and is free from multiple triggering. By comparison of the reference voltage with three voltage thresholds in a diagnostic circuit (6), line interruptions and short-circuits are recognised by battery voltage or reference voltage potentials.